

Show all work on a separate piece of paper!!**1-7 find the exact value of each of the six trig functions of θ , if the point is on the terminal side of the angle.**

1. $(-3, 4)$ 2. $(5, 12)$ 3. $(2, -3)$ 4. $(-1, -2)$ 5. $(-3, -3)$ 6. $(2, -2)$ 7. $(-3, 0)$

8-11 name the quadrant in which the angle θ lies.

8. $\sin \theta > 0, \cos \theta < 0$ 9. $\cos \theta > 0, \tan \theta > 0$ 10. $\sin \theta < 0, \cot \theta > 0$ 11. $\csc \theta > 0, \cot \theta < 0$

12-31 find the exact value of each expression. Do not use a calculator.

12. $\sin 150^\circ$ 13. $\cos 210^\circ$ 14. $\tan 315^\circ$ 15. $\sin 120^\circ$ 16. $\sec 240^\circ$
 17. $\csc 330^\circ$ 18. $\tan 225^\circ$ 19. $\sin 180^\circ$ 20. $\cot 60^\circ$ 21. $\tan 270^\circ$
 22. $\cos \frac{4\pi}{3}$ 23. $\sin \frac{5\pi}{4}$ 24. $\tan \frac{\pi}{4}$ 25. $\sec \frac{3\pi}{2}$ 26. $\cot \frac{7\pi}{6}$
 27. $\csc \frac{11\pi}{6}$ 28. $\sin \frac{\pi}{2}$ 29. $\cot \frac{2\pi}{3}$ 30. $\cos \frac{7\pi}{4}$ 31. $\csc \frac{\pi}{6}$

32-37 find the exact value of each of the remaining trig functions of θ .

32. $\sin \theta = -\frac{12}{13}, \theta$ in Quadrant 4 33. $\cot \theta = \frac{4}{5}, \theta$ in Quadrant 3 34. $\csc \theta = \frac{13}{5}, 90^\circ < \theta < 180^\circ$
 35. $\tan \theta = \frac{3}{4}, \sin \theta > 0$ 36. $\sec \theta = 2, \sin \theta < 0$ 37. $\cot \theta = \frac{4}{3}, \cos \theta < 0$

38-40, find all six trig functions with the given specifications.

38. If $\tan \theta = 3$, find $\tan(\theta + \pi)$ 39. If $\cos \theta = 0.4$, find $\cos(2\pi - \theta)$ 40. $\sin \theta = \frac{\sqrt{3}}{2}$, find $\sin(\pi - \theta)$

41-50, find the exact value of each expression.

41. $\sin 390^\circ$ 42. $\cos 420^\circ$ 43. $\sec \frac{13\pi}{3}$ 44. $\tan 585^\circ$ 45. $\csc \frac{11\pi}{4}$
 46. $\sin -180^\circ$ 47. $\cot \left(\frac{-\pi}{4}\right)$ 48. $\cos(-90^\circ)$ 49. $\csc\left(-\frac{\pi}{3}\right)$ 50. $\sec(-420^\circ)$

Answers:

1. $\sin \theta = 4/5, \cos \theta = -3/5, \tan \theta = -4/3, \csc \theta = 5/4, \sec \theta = -5/3, \cot \theta = -3/4$ 2. $\sin \theta = 12/13, \cos \theta = 5/13, \tan \theta = 12/5, \csc \theta = 13/12, \sec \theta = 13/5, \cot \theta = 5/12$
 3. $\sin \theta = \frac{-3\sqrt{13}}{13}, \cos \theta = \frac{2\sqrt{13}}{13}, \tan \theta = \frac{-3}{2}, \csc \theta = \frac{-\sqrt{13}}{3}, \sec \theta = \frac{\sqrt{13}}{2}, \cot \theta = -2/3$ 4. $\sin \theta = \frac{-2\sqrt{5}}{5}, \cos \theta = \frac{-\sqrt{5}}{5}, \tan \theta = 2, \csc \theta = \frac{-\sqrt{5}}{2}, \sec \theta = -\sqrt{5}, \cot \theta = 1/2$
 5. $\sin \theta = \frac{-\sqrt{2}}{2}, \cos \theta = \frac{-\sqrt{2}}{2}, \tan \theta = 1, \csc \theta = -\sqrt{2}, \sec \theta = -\sqrt{2}, \cot \theta = 1$ 6. $\sin \theta = \frac{-\sqrt{2}}{2}, \cos \theta = \frac{\sqrt{2}}{2}, \tan \theta = -1, \csc \theta = -\sqrt{2}, \sec \theta = \sqrt{2}, \cot \theta = -1$
 7. $\sin \theta = 0, \cos \theta = -3, \tan \theta = 0, \csc \theta = \text{undef}, \sec \theta = -1/3, \cot \theta = \text{undef}$ 8. 2 9. 1 10. 3 11. 2 12. $\frac{1}{2}$ 13. $\frac{-\sqrt{3}}{2}$ 14. -1 15. $\frac{\sqrt{3}}{2}$ 16. -2 17. -2 18. 1
 19. 0 20. $\frac{\sqrt{3}}{3}$ 21. Undef 22. -1/2 23. $\frac{-\sqrt{2}}{2}$ 24. 1 25. Undef 26. $\sqrt{3}$ 27. -2 28. 1 29. $\frac{-\sqrt{3}}{3}$ 30. $\frac{\sqrt{2}}{2}$ 31. 2
 32. $\sin \theta = -12/13, \cos \theta = 5/13, \tan \theta = -12/5, \csc \theta = -13/12, \sec \theta = 13/5, \cot \theta = -5/12$ 33. $\sin \theta = \frac{-5\sqrt{41}}{41}, \cos \theta = \frac{-4\sqrt{41}}{41}, \tan \theta = \frac{5}{4}, \csc \theta = \frac{-\sqrt{41}}{5}, \sec \theta = \frac{-\sqrt{41}}{4}, \cot \theta = 4/5$ 34. $\sin \theta = 5/13, \cos \theta = -12/13, \tan \theta = -5/12, \csc \theta = 13/5, \sec \theta = -13/12, \cot \theta = -12/5$ 35. $\sin \theta = 3/5, \cos \theta = 4/5, \tan \theta = 3/4, \csc \theta = 5/3, \sec \theta = 5/4, \cot \theta = 4/3$ 36. $\sin \theta = \frac{-\sqrt{3}}{2}, \cos \theta = \frac{1}{2}, \tan \theta = -\sqrt{3}, \csc \theta = \frac{-2\sqrt{3}}{3}, \sec \theta = 2, \cot \theta = \frac{-\sqrt{3}}{3}$ 37. $\sin \theta = -3/5, \cos \theta = -4/5, \tan \theta = 3/4, \csc \theta = -5/3, \sec \theta = -5/4, \cot \theta = 4/3$
 38. $\sin \theta = \frac{-3\sqrt{10}}{10}, \cos \theta = \frac{-\sqrt{10}}{10}, \tan \theta = 3, \csc \theta = \frac{-\sqrt{10}}{3}, \sec \theta = -\sqrt{10}, \cot \theta = 1/3$ 39. $\sin \theta = \frac{-\sqrt{21}}{5}, \cos \theta = \frac{2}{5}, \tan \theta = \frac{-\sqrt{21}}{2}, \csc \theta = \frac{-5\sqrt{21}}{21}, \sec \theta = \frac{5}{2}, \cot \theta = \frac{-2\sqrt{21}}{21}$
 40. $\sin \theta = \frac{\sqrt{3}}{2}, \cos \theta = \frac{1}{-2}, \tan \theta = -\sqrt{3}, \csc \theta = \frac{2\sqrt{3}}{3}, \sec \theta = -2, \cot \theta = \frac{-\sqrt{3}}{3}$ 41. $\frac{1}{2}$ 42. $\frac{1}{2}$ 43. 2 44. 1 45. $\sqrt{2}$ 46. 0 47. -1 48. 0 49. $\frac{-2\sqrt{3}}{3}$ 50. 2